



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material[®] 975a

Isotopic Standard for Chlorine

This Standard Reference Material (SRM) is intended for use as an isotopic standard. SRM 975a consists of 0.25 g of sodium chloride (NaCl). Purity of the NaCl is 99.89 % by mass. The certified isotopic compositions are given below together with the atomic weight of chlorine.

Absolute Abundance Ratio, $^{35}\text{Cl}/^{37}\text{Cl}$: 3.1279 \pm 0.0047

Isotopic Composition:

^{35}Cl , Atom Percent 75.774 \pm 0.028

^{37}Cl , Atom Percent 24.226 \pm 0.028

Atomic Weight: 35.45265 \pm 0.00055

The certified values for the absolute abundance ratio of $^{35}\text{Cl}/^{37}\text{Cl}$ and isotopic compositions of ^{35}Cl and ^{37}Cl were derived by directly comparing nine randomly selected bottles of this material, measured in duplicate, with SRM 975. Measurements were made by thermal ionization mass spectrometry (TIMS) on a NIST designed solid source mass spectrometer utilizing a tantalum single filament procedure developed by Xiao [1].

In order to accurately transfer the overall limits of error from the original measurements of SRM 975 [2] to SRM 975a, all uncertainties were converted to ISO equivalent values [3]. These values were then propagated with the analysis uncertainties for both SRM 975 and SRM 975a to derive a 95 % expanded uncertainty with a coverage factor of $k = 2.023$ for 39 degrees of freedom.

Expiration of Certification: The certification of SRM 975a is valid indefinitely, within the measurement uncertainties specified, provided the SRM is handled in accordance with instructions given in this certificate (see Instructions for Use). This certification is nullified if the SRM is contaminated or modified for other than for its intended use.

Maintenance of Certification: NIST will monitor this SRM lot over the period of its certification. If substantive changes occur that affect the certification, NIST will notify the purchaser.

Overall direction and coordination of the technical measurements leading to the certification of this SRM were performed by R.D. Vocke of the NIST Analytical Chemistry Division.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the NIST Standard Reference Materials Program by N.M. Trahey.

Willie E. May, Chief
Analytical Chemistry Division

Gaithersburg, MD 20899
Certificate Issue Date: 24 January 2001

Nancy M. Trahey, Chief
Standard Reference Materials Program

Analyses were performed by Y.K. Xiao, Guest Scientist, and R.D. Vocke of the NIST Analytical Chemistry Division.

Statistical consultation was provided K.R. Eberhardt of the NIST Statistical Engineering Division.

INSTRUCTIONS FOR USE

This SRM should be stored in its original container, tightly sealed, and in a desiccator. The material should **NOT** be dried before use.

REFERENCES

- [1] Xiao, Y.K. and Zhang, C.G., *Int. J. Mass Spectrom. Ion Proc.*, **116**, pp. 183-192, (1992).
- [2] Shields, W.R., Murphy, T.J., Garner, E.L., and Dibeler, V.H., *JACS*, **84**, pp. 1519-1522, (1962).
- [3] *Guide to the Expression of Uncertainty in Measurement*, ISBN 92-67-10188-9, 1st Ed. ISO, Geneva, Switzerland, (1993); see also Taylor, B.N. and Kuyatt, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note 1297, U.S. Government Printing Office, Washington DC, (1994); available at <http://physics.nist.gov/Pubs>.

Users of this SRM should ensure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-6776; fax (301) 926-4751; e-mail srminfo@nist.gov; or via the Internet <http://www.nist.gov/srm>.